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DISPLAY AND ANTI-THEFT DEVICE

BACKGROUND OF THE INVENTION

[0001] Embodiments of the present invention relate generally to display and anti-theft devices for consumer electronic devices.

[0002] A recent trend in retail environments is to use smart devices, sometimes cellphones, but more often handheld tablets, as customer service devices. This usage takes on two forms. One form is using a tablet as a kiosk where customers can interact with the device. This may be used to deliver information about the establishment or its products to the consumer or even act as an interface for customer loyalty programs in lieu of plastic cards. A second usage is for store personnel to take these devices with them around the store to help assist customers. The associate might do things like pull up a store map to show a customer where an item is, check on a price of an item, or pull up specifications on a product a customer is considering buying. In some stores, the tablets are even being used to check out customers on the spot. Restaurants might use these devices at a table for ordering or game playing. Entities such as hospitals may allow doctors and nurses to carry around these smart devices for instant access to patient's health charts. Moreover, schools may also utilize these devices for instructional purposes.

[0003] With the proliferation of handheld tablet computing devices, a new paradigm has emerged in communal use of these devices. For example, retailers are providing these tablets to store personnel to assist customers or remotely check out a customer. Schools may have students checking out tablets from a pool. Hospitals may have nurses and doctors that carry tablet devices during their work day and return them to a communal pool after their shift. These new use cases require a new way of protecting these tablets from theft, while also displaying the tablets in a presentable manner.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0004] Embodiments of the present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which various embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

[0005] Reference will now be made to the accompanying drawing figures wherein identical reference numerals denote the same or similar elements throughout the various views. FIGS. 1-3 show embodiments of a display and anti-theft device, indicated generally by reference character 20, for protecting a tablet or portable electronic device, indicated generally by reference character T, against theft or unauthorized removal. As used herein, the term “tablet” is intended to include without limitation all types of portable, personal computers, for example, laptop, notebook, mini-notebook, sub-notebook and netbook type computers, as well as personal data assistant (PDA) type devices and smart devices. It is understood that the display and anti-theft device 20 is capable of being used with any number of portable electronic devices, such as cellular phones or smart phones, such that use of the term “tablet” is not intended to be limiting.

[0006] Embodiments of the present invention are directed to display and anti-theft devices 20 comprising a dock 30, docking station, base, stand, or the like configured to temporarily support the portable electronic device T. In some instances, the portable electronic device T is configured to be readily placed on the dock 30 in a display orientation (e.g., landscape or portrait orientations) and removed from the dock by an authorized user. For example, a retail associate may utilize a tablet for point-of-sale transactions and wish to temporarily secure the tablet to the dock 30. In addition, the dock 30 may be configured to be alarmed, locked, and/or otherwise secured so that unauthorized personal cannot remove the portable electronic device T, as explained in further detail below. The dock 30 is configured to be fixed to a support surface, counter, or wall, such as with one or more fasteners and/or adhesive, although the dock may be

simply freestanding on a support surface in some embodiments. For example, FIGS. 1-3 show that the dock 30 may be supported on a table or counter and may include a stem portion 34 and a base portion 36. The stem portion 34 may extend upwardly from the base portion 36 at an angle (e.g., an oblique angle). In another embodiment, FIGS. 4-6 show that the dock 30' may be secured to a wall and include a stem portion 34' and a base portion 36'. In this embodiment, the stem portion 34' and base portion 36' may be positioned adjacent to one another. For example, the handle 22 may be configured to operably engage the dock 30' along an axis that is generally parallel to a vertical support surface such as a wall.

[0007] In some embodiments, the portable electronic device T is not enclosed within a shroud, case, or frame. Rather, as shown in FIGS. 1-4, the portable electronic device T may be secured directly to a handle 22. For example, the portable electronic device T may be secured to the handle 22 with an adhesive (e.g., a releasable adhesive). In one embodiment, the handle 22 comprises a base portion 24 configured to be attached to the portable electronic device T and a handle portion 26 configured to releasably engage the dock 30. When removed from the dock 30, a user is able to grasp the handle portion 26 for carrying and using the portable electronic device T. Thus, in some instances, the user is not required to hold the portable electronic device T, but rather holds the handle portion 26, which may provide a more user-friendly experience. The length of the handle portion 26 may be of sufficient length to enable grasping by a user (e.g., at least 2 inches, at least 3 inches, at least 4 inches, at least 5 inches, or at least 6 inches in length). In some cases, the handle portion 26 is configured to pivot relative to the base portion 24, such as via pivot member 28. For example, the handle portion 26 may be configured to tilt relative to the base portion 24 to a desired display orientation and/or to rotate between portrait and landscape orientations.

[0008] The handle 22 and dock 30 are configured to releasably engage with one another. For instance, the handle 22 may be sized and configured to receive a portion of the dock 30 therein, although the dock may be alternatively sized and configured to receive a portion of the handle. For example, FIGS. 4-6 show that the base portion 34'

may define an opening or recess 38' configured to receive a portion of the handle portion 26, and the handle portion is configured to receive a portion of the stem portion 36'. The handle portion 26 may be configured to slide onto the stem portion 34, 34' of the dock 30, 30' in a releasable engagement that supports the handle and portable electronic device on the dock, while also establishing an electrical connection therebetween, as will be described in greater detail below. The mechanical connection between the handle portion 26 and the stem portion 34, 34' may be facilitated using various mating geometries, keying means, press fit, or the like.

[0009] In some embodiments, the handle 22 is configured to engage the dock 30 for establishing an electrical connection therebetween. For example, the dock 30 may be operably coupled to a power source such that engagement between the handle 22 and the dock 30 facilitates power delivery to the portable electronic device T. In some cases, the handle 22 includes a cable assembly 40 (see, e.g., FIGS. 9-10). The cable assembly 40 may include a first connector 42 at one end configured to engage an input port of the portable electronic device T, a second connector 44 at an opposite end configured to engage the dock 30, and a cable 43 extending between the connectors 42, 44. At least a portion of the length of cable 43 is configured to extend through the handle 22. For example, the cable 43 may extend through both the base portion 24 and the handle portion 26. The cable 43 may be flexible and include one or more conductors for transferring power and/or data to or from the portable electronic device. A portion of the cable 43 extending between the connector 42 and the base portion 24 may be adjustable depending on the size of the portable electronic device. Excess length of cable 43 may be configured to be routed within the handle 22. In one embodiment, the base portion 24 of the handle 22 includes an opening 49 configured to receive the connector 42 and the cable 43 therethrough (see, e.g., FIGS. 7-8). A housing 47 may be configured to be positioned over the connector 42 and portion of the cable 43 extending between the connector 42 and the base portion 24 to facilitate engagement between the connector 42 and the input port of the portable electronic device. The housing 47 may be secured to the portable electronic device with an adhesive in some embodiments. Each of the

connectors 42, 44 may be any desired type (e.g., USB-A, micro-USB, USB-C, etc.). In one example, the connector 42 is a male connector, while the connector 44 is a female connector.

[0010] Similarly, the dock 30 may include a cable assembly 50 having a first connector 52 at one end configured to operably engage connector 44, a second connector 54 at an opposite end configured to operably engage a power source, and a cable 53 extending between the connectors 52, 54. At least a portion of the length of cable 53 is configured to extend through the dock 30. For example, the cable 53 may extend through both the base portion 34 and the stem portion 36. The cable 53 may be flexible and include one or more conductors for transferring power and/or data to or from the portable electronic device. Each of the connectors 52, 54 may be any desired type (e.g., USB-A, micro-USB, USB-C, etc.). In one example, the connector 52 is a male connector, while the connector 54 is a male or female connector. In order to facilitate installation of the cable assembly 50, the stem portion 36, or a portion thereof, may be removable. For example, the stem portion 36 may include a cover 57 that is removable for routing the cable 53 and connector 52 through the dock 30. In addition, the stem portion 36 and/or cover 57 may include an opening or recess for receiving and securing the connector 52 in place.

[0011] Advantageously, the cable assembly 40 may be coupled to the handle 22 such that the cable assembly 40 does not need to be removed prior to removing the handle from the dock 30. Thus, the handle 22 may be configured to carry the cable assembly 40 when removed from the dock 30. In addition, the connectors 44, 52 are configured to releasably engage one another in response to placement of the handle portion 26 on the stem portion 36. Thus, the handle 22 may be positioned on and electrically connected to the dock 22 using a “blind” connection. Moreover, the cable assemblies 40, 50 may not be required to be original equipment manufacturer (OEM) cables such that the cable assemblies may be customized depending on the type and power requirements of the portable electronic device T. Thus, once the cable assemblies 40, 50 are installed, swapping of different types of cables are not required since the customized cable

assemblies 40, 50 are configured to be compatible with one another.

[0012] In one embodiment, the dock 30 includes an alarming device 32 configured to arm when the portable electronic device T is positioned on the dock and to disarm when the portable electronic device is removed by an authorized user. In this case, the dock 30 may include an internal power source 58 (e.g., one or more batteries) or may be coupled to an external power source via a cable 60. The portable electronic device T may be operably engaged with the dock 30 and/or the alarming device 32 in a wireless manner (i.e., no cable or tether is required to attach the portable electronic device to the dock), although wired means may be used if desired. An LED or other signaling device may be used to indicate that the display and anti-theft device 20 is armed and/or disarmed. In addition, the alarming device 32 and/or portable electronic device T may be configured to generate a security signal (e.g., a visual indicator and/or an audible alarm) in response to unauthorized removal of the portable electronic device from the dock.

[0013] In some embodiments, the display and anti-theft device 20 comprises a lock mechanism 62 for securing the portable electronic device T within the dock 30, which may include, for example, electrical, magnetic, and/or mechanical interaction. For example, the lock mechanism 62 may be configured to automatically lock when the handle 22 is positioned on the dock 30. In one embodiment, the automatic lock may be triggered using a switch (e.g., a mechanical switch or an optical switch). The lock mechanism 62 may be configured to automatically relock after a predetermined period of time. In order to release the portable electronic device T, an authorized user could use a key or some other security means (e.g., a passcode) to disarm the alarming device 32 and/or disengage the lock mechanism 36. In other embodiments, manual actuation (e.g., push button) by a user may unlock the lock mechanism 62 such that no key or security means is required. In some embodiments, locking and/or unlocking via the lock mechanism 62 may be facilitated using a motor, solenoid, or the like.

[0014] An unlocking feature for removing the portable electronic device T or disarming the alarming device 32 may take many forms. One embodiment is an electrical key 35 utilizing radiofrequencies, acoustic waves, magnetic waves, infrared, or

some other electronic means to wirelessly communicate or otherwise operably communicate with the dock 30 and/or alarming device 32 to allow the handle 22 to be released. For example, the dock 30 may include a port 56 for receiving a signal from the key 35 having a unique identifying code recognizable by the dock 30 or the portable electronic device but otherwise unrecognizable by other docks not associated with the code (e.g., in other departments or stores). Moreover, in one embodiment, the key 35 may have a limited timeframe in which the key is operable to remove the handle 22 from the dock 30. For instance, the key 35 may time out within a predetermined period of time (e.g., 6-10 hours). For example, the key 35 may be similar to that disclosed in United States Patent No. 7,737,845, the contents of which are hereby incorporated by reference in their entirety.

[0015] As discussed above, in some embodiments, the handle portion 26 is configured to pivot relative to the base portion 24, such as via a pivot member 28. FIGS. 11-13 show another embodiment of a pivot member 28'. In this embodiment, the pivot member 28' includes a pair of inner 64 and outer 66 bearing members. An upper hinge bracket 68 is disposed between the inner 64 and outer 66 bearing members and is configured to be attached to the base portion 24. One or more washers 70 may be positioned adjacent to the inner bearing member 64 and/or the outer bearing member 66. One or more of the washers 70 may be a wave washer 72 or the like which is configured to maintain the hinge member 68 in one or more angular positions. Thus, a user may be able to pivot the portable electronic device to different angular positions, and the pivot member 28' is able to maintain the portable electronic device in the desired angular position. The pivot member 28' may also include front and/or rear stop members 78, which may be employed to limit the degree of angular tilt of the base portion 24 relative to the handle portion 26.

[0016] FIG. 12 shows a cross-sectional view of the handle 22, while FIG. 13 shows a partially assembled view of the handle 22. It can be seen that the pivot member 28' also includes a lower hinge bracket 82 disposed within the handle portion 26 that may be positioned between a fastener 76 and a wave washer 72. The inner bearing member 64

may be positioned adjacent to the upper hinge bracket 68 and is configured to pivot relative to the outer bearing member 66. Thus, in some cases, the outer bearing member 66 may directly contact the upper hinge bracket 68 and be configured to pivot respect to one another. An axle 74 may be configured to pass through the inner 64 and outer 66 bearing members, upper hinge bracket 68, and washers 70. One or more fasteners 76 may assemble the pivot member 28' together. A hollow tube 84 may be configured to be positioned over the axle 74 and between one or more washers 70. One or more washers 70 may be configured to be positioned between the hollow tube 84 and the inner bearing member 64. Thus, the pivot member 28' may provide a convenient way to readily allow the portable electronic device to be positioned in different angles of tilt, while also providing a mechanism that limits wear to the bearing surfaces due to the ability to use a plastic surface (e.g., the outer bearing member 66) in contact with a metal surface (e.g., the upper bracket member 68). Moreover, the alternation of metal (e.g., fasteners, washers, and bracket members) and plastic components (e.g., bearing members) may provide the desired coefficient of friction as well as provide a desired axial force through the axis of the axle.

[0017] Furthermore, FIGS. 14-15 demonstrate that the handle 22 and the dock 30 may each include one or more electrical contacts 80 for facilitating the transfer of power, data, and/or security signals to or from the portable electronic device. For example, the handle portion 26 may include a plurality of electrical contacts and the stem portion 34 may include a plurality of contacts that are configured to align with one another and make electrical contact when the handle is 22 positioned on the dock 30. In some cases, the electrical contacts 80 of the handle 22 may be electrically connected to a cable 43 that is configured to be routed through the handle portion 26 to a connector 42. In one embodiment, the cable 43 is configured to be wrapped about the axle 74 and/or the tube 84 at least one revolution, which may provide better strain relief on the cable due to flexing of the cable.

[0018] FIG. 16 shows an embodiment of the fully assembled anti-theft device including the handle 22 and dock 30 of FIGS. 11-15.

[0019] The foregoing has described one or more embodiments of a display and anti-theft device for protecting a tablet or similar portable electronic device from theft or unauthorized removal. Those of ordinary skill in the art will understand and appreciate that numerous variations and modifications of the invention may be made without departing from the spirit and scope of the invention. Accordingly, all such variations and modifications are intended to be encompassed by the appended claims.

That which is claimed is:

1. A display and anti-theft device comprising:
a dock configured to be fixed to a support surface and to support a portable electronic device in a display orientation, the dock comprising a cable assembly for electrically coupling to a power source; and
a handle configured to be attached to the portable electronic device, the handle comprising a cable assembly operably coupled to an input port of the portable electronic device,
wherein the handle is configured to receive a portion of the dock for mating connection between the cable assemblies for establishing an electrical connection between the power source and the portable electronic device.
2. The display and anti-theft device of Claim 1, further comprising a lock mechanism for locking the portable electronic device to the dock.
3. The display and anti-theft device of Claim 1, further comprising an alarming device operably engaged with the dock.
4. The display and anti-theft device of Claim 1, wherein the dock is configured to communicate with a key for permitting authorized removal of the portable electronic device from the dock.
5. The display and anti-theft device of Claim 1, wherein the portable electronic device is configured to be secured wirelessly within the dock.
6. The display and anti-theft device of Claim 1, wherein the dock and/or portable electronic device is configured to generate a security signal when the portable electronic device is separated from the dock in an unauthorized manner.
7. The display and anti-theft device of Claim 1, wherein the cable assembly of the handle comprises a cable having a first connector configured to engage the input

port and a second end having a second connector at an opposite end.

8. The display and anti-theft device of Claim 7, wherein the cable assembly of the dock comprises a cable having a first connector configured to engage the power source and a second connector at an opposite end, and wherein the second connector of the handle is configured to releasably engage the second connector of the dock.

9. The display and anti-theft device of Claim 8, wherein the second connector of the handle and the second connector of the dock each comprises a USB connector.

10. The display and anti-theft device of Claim 1, wherein the handle comprises a base portion configured to be attached to the portable electronic device and a handle portion configured to engage the dock.

11. The display and anti-theft device of Claim 10, wherein the base portion is configured to pivot relative to the handle portion.

12. The display and anti-theft device of Claim 1, wherein the handle does not include a shroud, case, or frame for enclosing the portable electronic device.

13. A method for displaying a portable electronic device, the method comprising:

attaching a handle to a portable electronic device, the handle comprising a cable assembly;

coupling the cable assembly of the handle to an input port of the portable electronic device;

positioning a dock on a support surface, the dock comprising a cable assembly for electrically coupling to a power source; and

positioning the handle on the dock for mating connection between the cable assemblies for establishing an electrical connection between the power source and the portable electronic device.

14. The method of Claim 13, wherein the cable assembly of the handle and the dock are not OEM cable assemblies.

15. The method of Claim 13, further comprising removing the handle from the dock without first removing the cable assembly from the input port of the portable electronic device.

16. A display and anti-theft device comprising:

a dock configured to be fixed to a support surface and to support a portable electronic device in a display orientation, the dock electrically coupled to a power source; and

a handle configured to be attached to the portable electronic device, the handle comprising a cable assembly operably coupled to an input port of the portable electronic device,

wherein the handle is configured to receive a portion of the dock for establishing an electrical connection between the power source and the portable electronic device.

ABSTRACT

An anti-theft device for protecting a portable electronic device from theft or unauthorized removal in a retail environment is provided. The anti-theft device includes a dock configured to be fixed to a support surface and to support a portable electronic device in a display orientation. The dock includes a cable assembly for electrically coupling to a power source. The anti-theft device also includes a handle configured to be attached to the portable electronic device. The handle includes a cable assembly operably coupled to an input port of the portable electronic device. The handle is configured to receive a portion of the dock for mating connection between the cable assemblies for establishing an electrical connection between the power source and the portable electronic device.



FIGURE 1



FIGURE 2

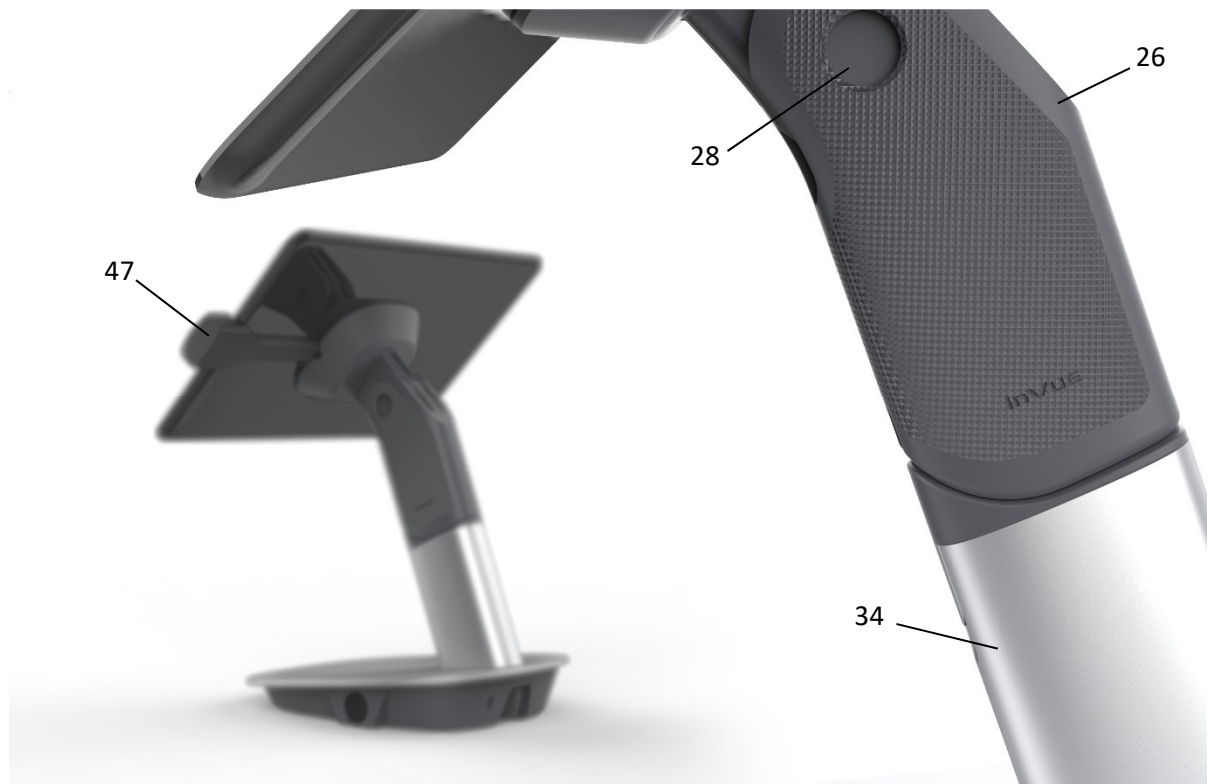


FIGURE 3

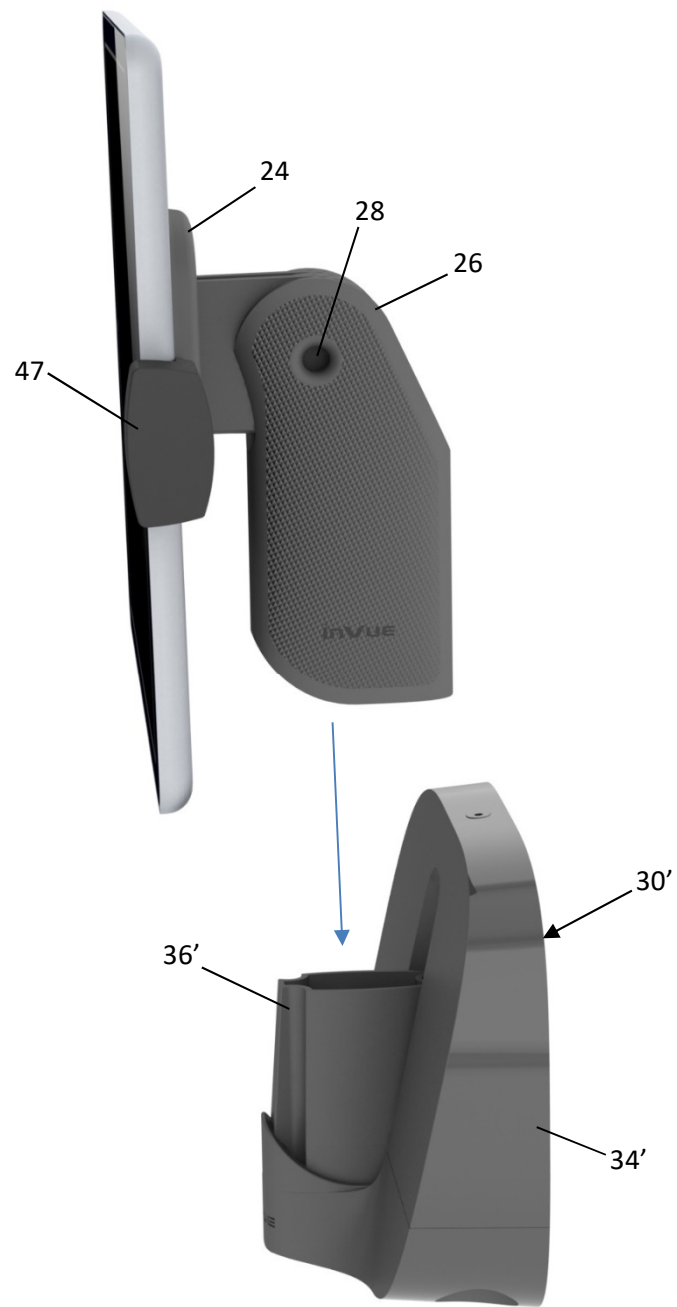


FIGURE 4

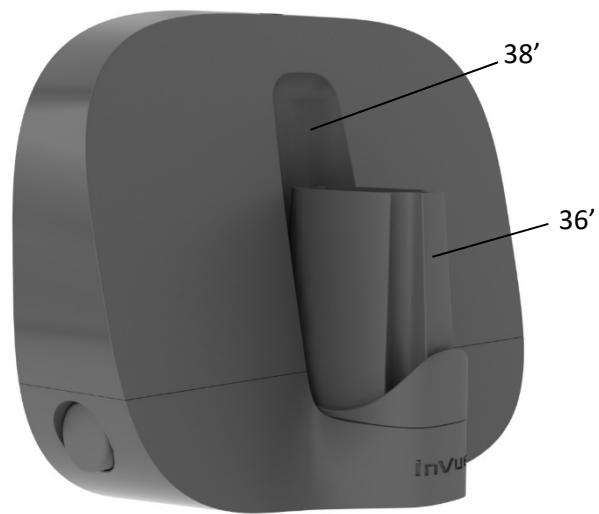


FIGURE 5

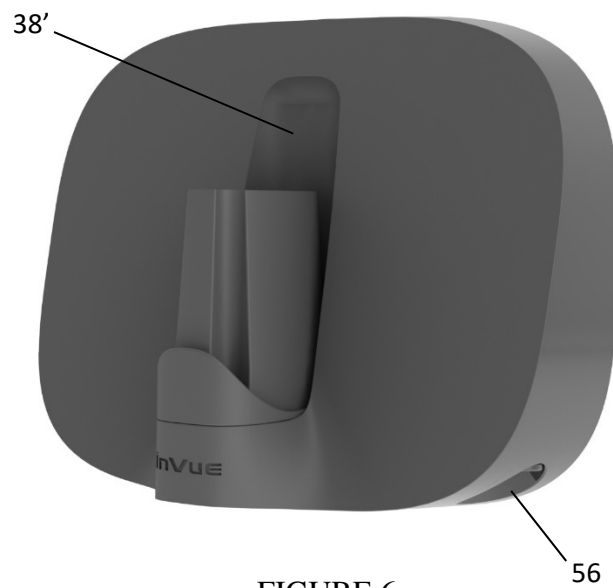


FIGURE 6

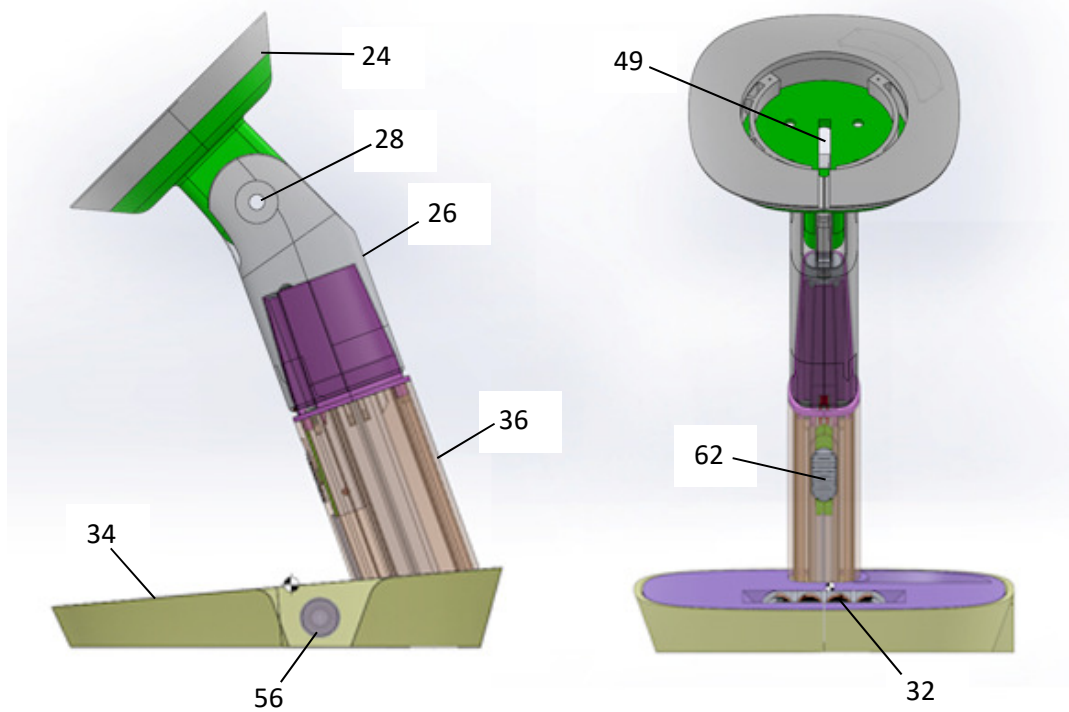


FIGURE 7

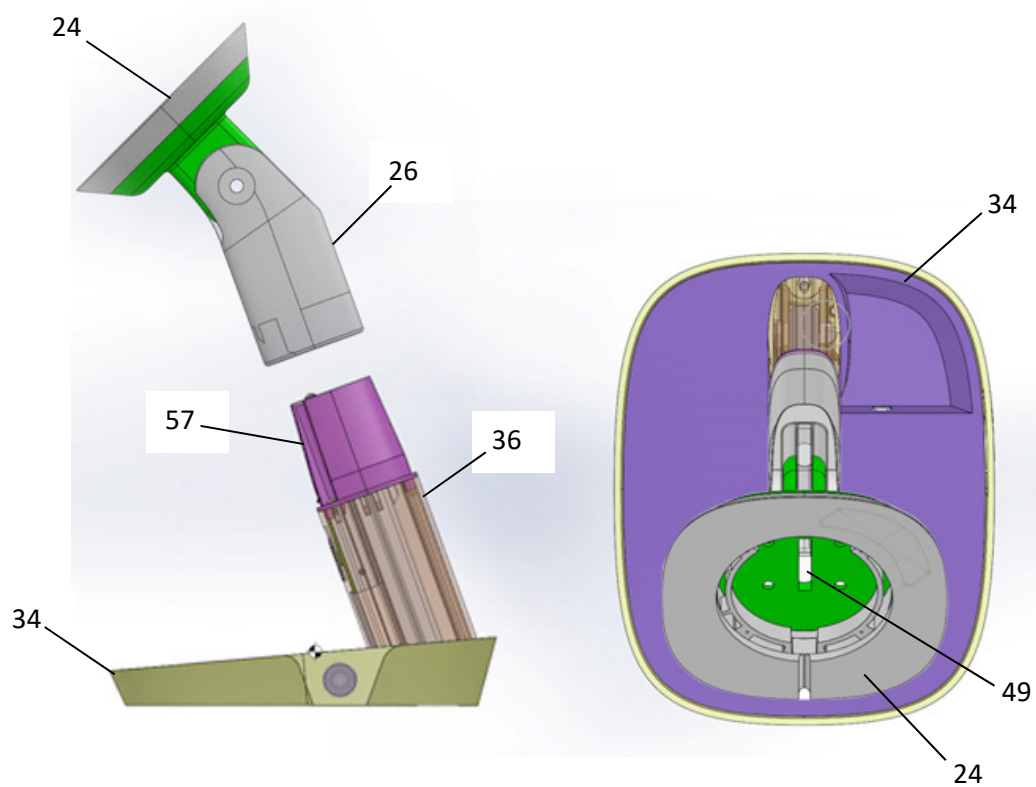


FIGURE 8

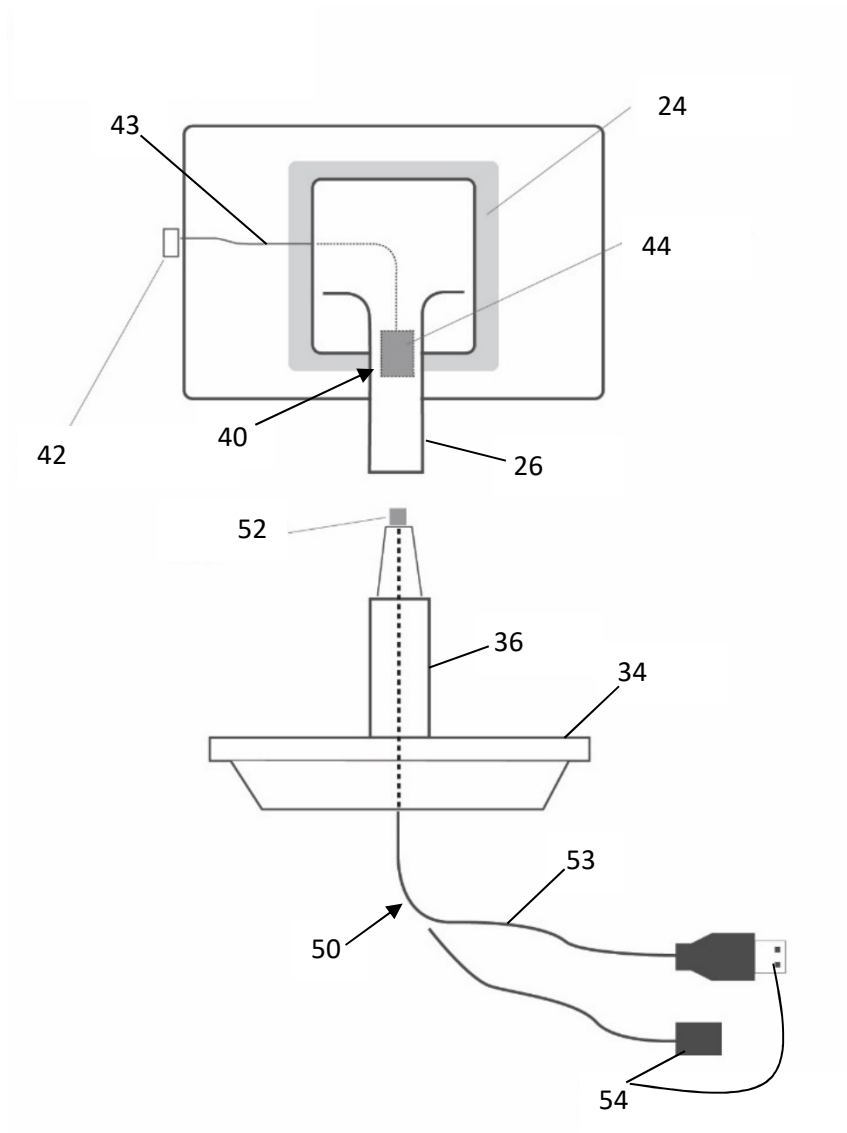


FIGURE 9

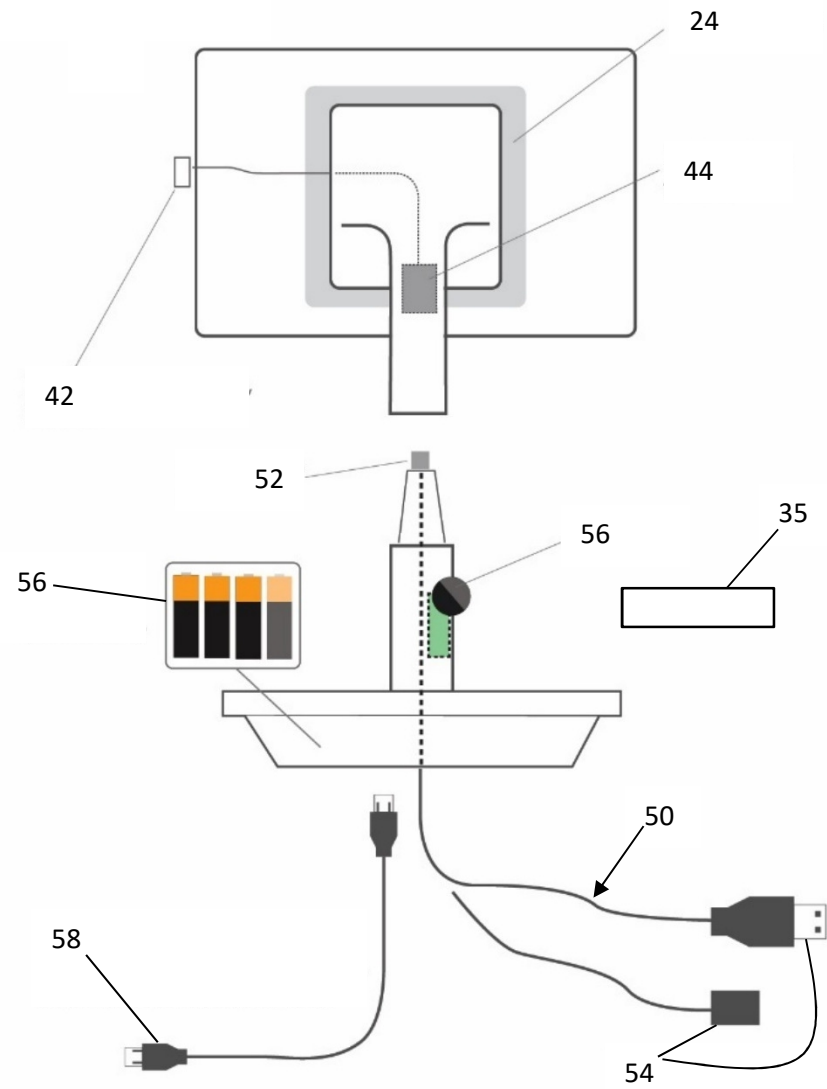


FIGURE 10

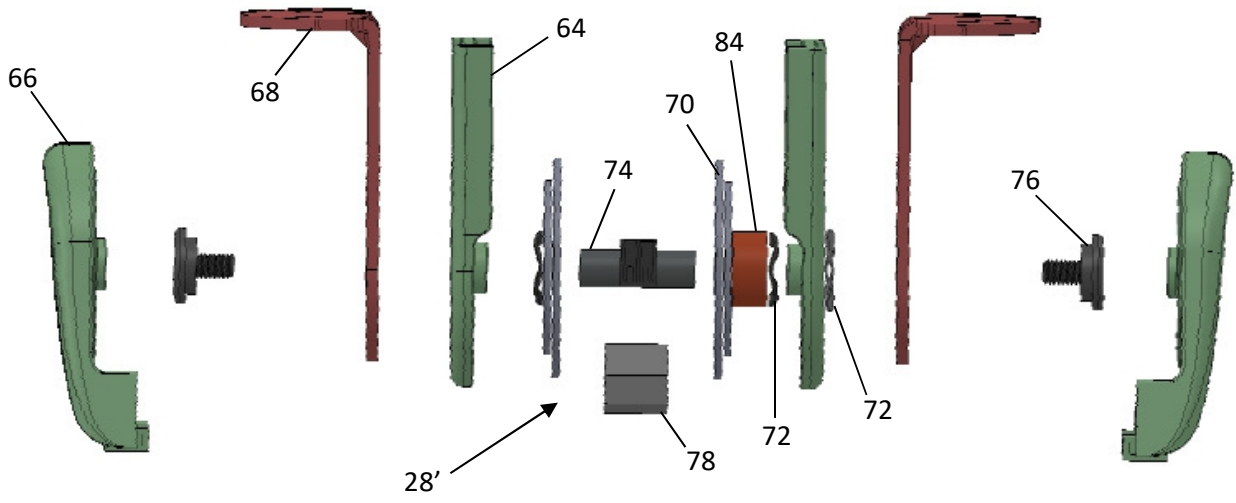


FIGURE 11

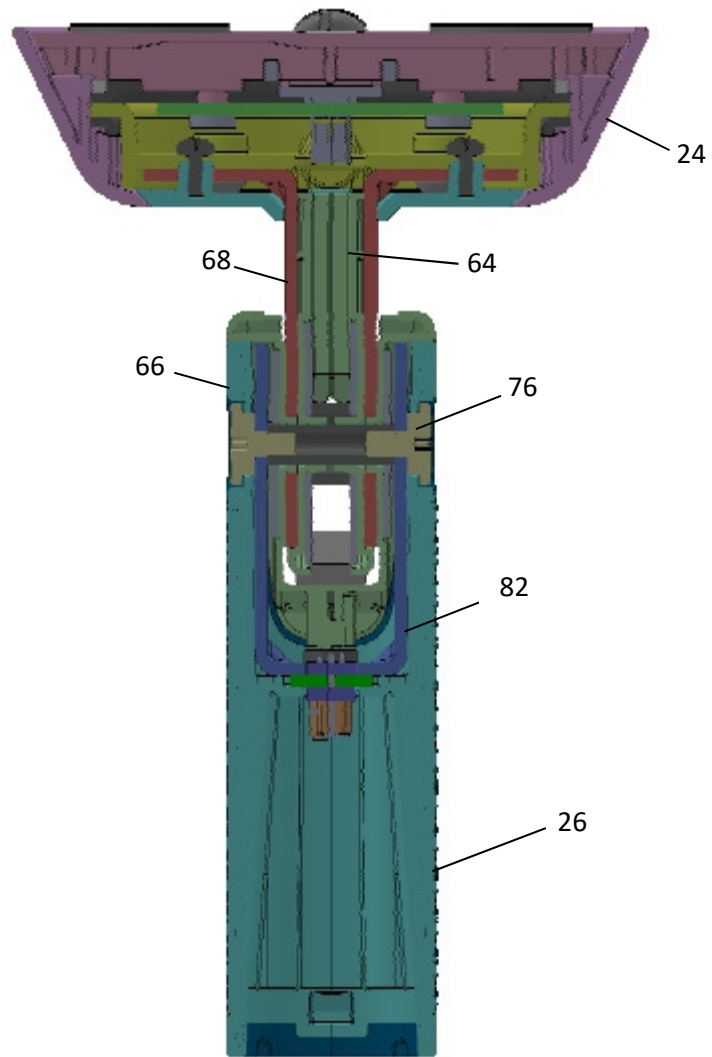


FIGURE 12

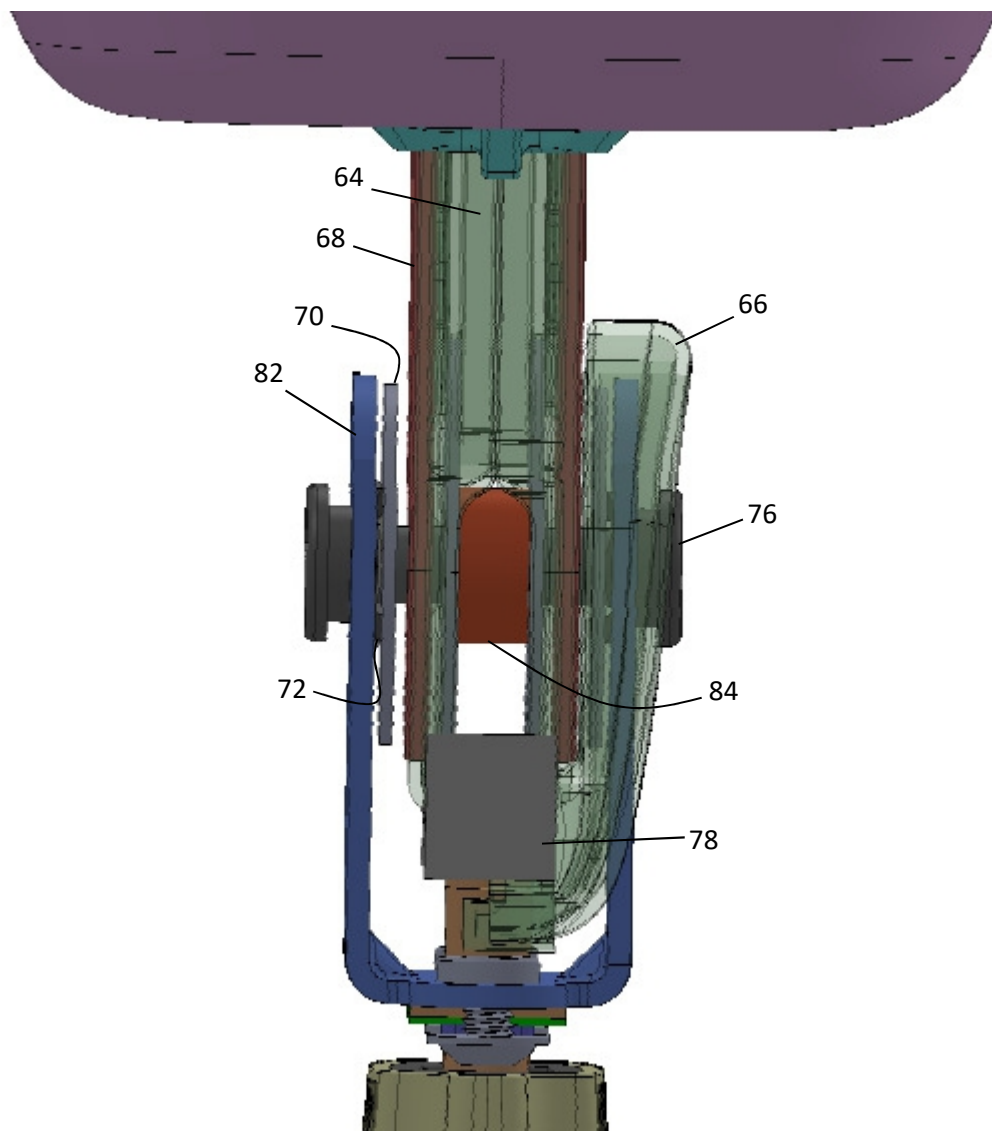


FIGURE 13

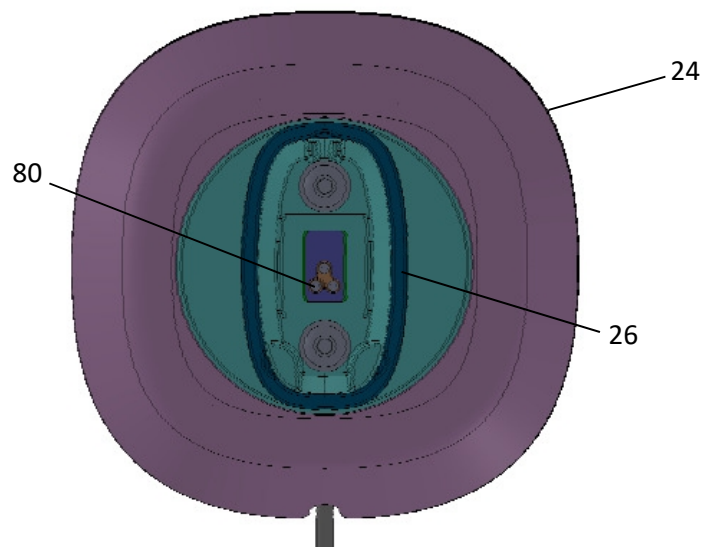


FIGURE 14

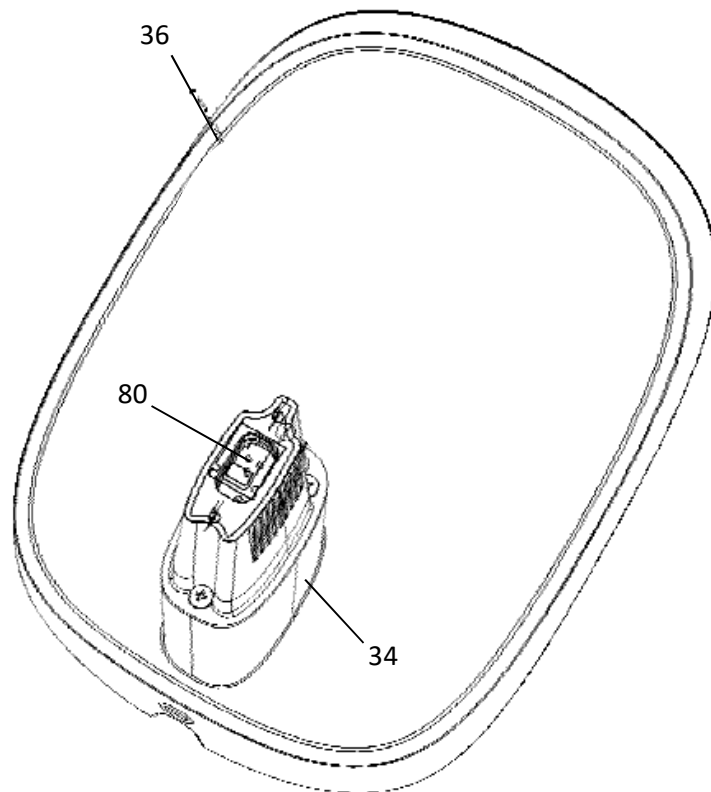


FIGURE 15

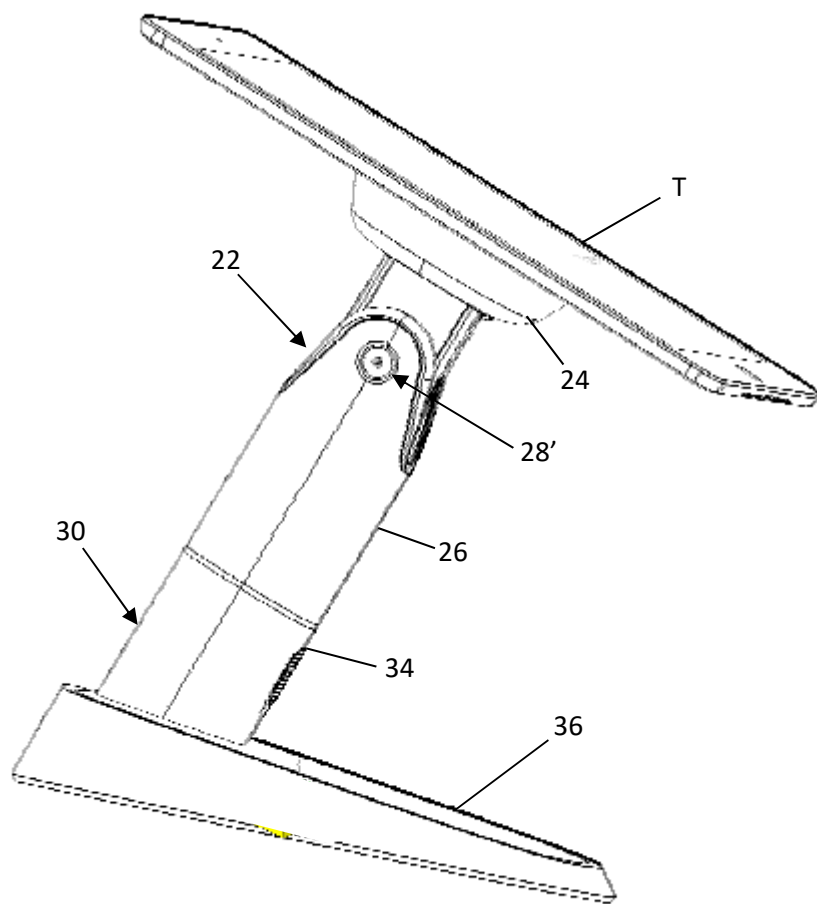


FIGURE 16